

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 January 2001 (11.01.2001)

PCT

(10) International Publication Number
WO 01/01817 A1

(51) International Patent Classification⁷: **A46B 9/04, 9/06**

(21) International Application Number: **PCT/EP00/05947**

(22) International Filing Date: **26 June 2000 (26.06.2000)**

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
99202151.9 2 July 1999 (02.07.1999) EP

(71) Applicant (*for all designated States except AG, AU, BB, CA, CY, GB, GD, GH, GM, IE, IL, IN, KE, LK, LS, MN, MW, NZ, SD, SG, SL, SZ, TT, TZ, UG, ZA, ZW*): **UNILEVER N.V. [NL/NL]; Weena 455, NL-3013 AL Rotterdam (NL).**

(71) Applicant (*for AG, AU, BB, CA, CY, GB, GD, GH, GM, IE, IL, KE, LK, LS, MN, MW, MZ, NZ, SD, SG, SL, SZ, TT, TZ, UG, ZA, ZW only*): **UNILEVER PLC [GB/GB]; Unilever House, Blackfriars, London, Greater London EC4P 4BQ (GB).**

(71) Applicant (*for IN only*): **HINDUSTAN LEVER LTD [IN/IN]; Hindustan Lever House, 165-166 Backbay Reclamation, Mumbai 400 020, Maharashtra (IN).**

(72) Inventor: **CALABRESE, Giuseppe; Lever Faberge, Via Lombardia, 1, I-20083 Gaggiano (IT).**

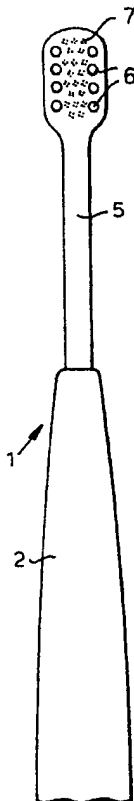
(74) Agent: **KAN, Jacob; Unilever N.V., Olivier van Noortlaan 120, NL-3133 AT Vlaarding (NL).**

(81) Designated States (*national*): **AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU,**

[Continued on next page]

(54) Title: **ELECTRIC TOOTHBRUSH**

(57) Abstract: An electric toothbrush comprises a handle and a head, characterised in that the head has a rubbery cleaning element.



WO 01/01817 A1



ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— With international search report.

(84) **Designated States (regional):** ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE,

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

- 1 -

ELECTRIC TOOTHBRUSH

The present invention concerns an electric toothbrush comprising a handle and a head, characterised in that the
5 head has a rubbery cleaning element.

Electric toothbrushes are well known in the art and typically comprise a motor element housed within the brush handle and a head, which is usually replaceable.

10 Most electric brushes effect cleaning by rapidly moving the brush head (hereinafter known as oscillating brushes) but some merely vibrate (hereinafter known as vibrating brushes).

15 There is a multitude of oscillating brushes on the market and some have particular oscillating patterns, e.g. longitudinally oscillating elements, or they may have multiple brush heads, such as the one marketed by Phillips
20 under the tradename 'Plaque Remover ®', which comprises a rotating head and a laterally oscillating array of bristles distal to the brush handle.

An example of a vibrating brush is sold by J&J under the
25 tradename 'Powerbrush®'.

Manual brushes with rubbery bristles are well-known in the prior art and may provide a polishing, cleaning or gum managing benefit. For example, WO 98/22000 (Asher)
30 discloses a brush comprising at least one plaque removing member which is surrounded by a plurality of bristles.

- 2 -

In our co-pending application GB 9912923.1 we describe a brush comprising a housing for a motor and a brush head which is flexible.

- 5 We have found that the benefits provided by a brush head comprising a rubbery cleaning element can be greatly enhanced if provided on an electric toothbrush.

10 An object of the present invention is to provide a cheap electric toothbrush, which provides an improved cleaning benefit.

We have found that an electric toothbrush can provide an improvement upon the prior art when the brush head comprises
15 rubbery cleaning elements.

Accordingly, the present invention provides an electric toothbrush, characterised in that it comprises a rubbery cleaning element.
20

By rubbery cleaning element is meant a cleaning element, e.g. a bristle, which is made of a rubbery material ie. one which exhibits flexible and resilient characteristics.

- 25 In a preferred embodiment, the rubbery cleaning element is in the form of fingers which are generally thicker than conventional nylon bristles.

In a particularly preferred embodiment, the rubbery cleaning
30 element is in the form of a flap or lamella. Such a flap or

- 3 -

lamella may be either linear or arcuate in a cross-section parallel to the brush head base.

Depending on the size of the rubbery element it is envisaged
5 that any number of rubbery elements may be present on the brush and may be in combination with any member of bristle tufts.

A rubbery cleaning element is an enlarged bristle made of a
10 rubbery material. By rubbery is meant that the material has some elastic nature. Given that electric toothbrushes vibrate at an extremely high frequency it is anticipated that a high elastic nature is not necessary and a material with a Shore A hardness of less than 100 is suitable for use
15 in the present invention.

In a preferred embodiment, the rubbery material has a Shore A hardness of less than 100, more preferably less than 80, and especially less than 55. Preferably the rubbery
20 material also has a minimum Shore A hardness of 15, more preferably 25.

Particularly suitable rubbery material include elastomeric materials such as those described in W097/20484, the
25 contents of which are incorporated by reference.

It is also envisaged that the head of the brush according to the invention is replaceable.

30 The rubbery cleaning element may also serve to provide a polishing benefit to the teeth surfaces.

- 4 -

It is also possible for the rubbery cleaning element to additionally comprise abrasive materials such as silicas to enhance the cleaning or polishing benefit.

5 In an alternative aspect the invention provides an electric toothbrush with improved sensory benefits. The brush according to the invention provides an improved feel in the oral cavity, due to the presence of the rubbery material. This is particularly so when the non-bristle bearing
10 surfaces of the head is significantly covered by a rubbery material and contacts the buccal lining. This sensory benefit is seen as an important consumer positive.

The head of the brush according to the invention may either
15 be a vibrating head or an oscillating head. For example, the rubbery cleaning element may merely vibrate to effect cleaning or it may be fixed on a rotating head.

The invention will not be described with reference to the
20 non-limiting figure.

Figure 1 is an elevation of a brush according to the invention. It shows a brush (1) comprising a handle (2) and a head (3). The head (3) comprises a bristle bearing portion
25 (4) and a neck portion (5). The bristle bearing portion (4) comprises a rubbery cleaning element (6) and conventional bristle tufts (7).

Typically, the handle (2) will comprise a motor element
30 which vibrates or oscillates at least the brush head (3).

- 5 -

Figure 2 is a plan view of the brush shown in Figure 1 showing the layout of the rubbery cleaning members and the conventional bristle tufts.

- 5 Figure 3 is a plan view of a brush head designed to rotate around a central point (9).

Shown are rubbery cleaning elements in the form of fingers (10) and lamellae (8) as well as conventional bristles (7).

- 6 -

CLAIMS

1. An electric toothbrush comprising a handle and a head,
characterised in that the head has a rubbery cleaning
5 element.
2. A toothbrush according to claim 1, characterised in that
the head comprises a rubbery lamella.
- 10 3. A toothbrush according to claim 1 or 2, characterised in
that the head comprises a rubbery lamella and a bristle
tuft.
4. A toothbrush according to any preceding claim,
15 characterised in that the head is replaceable.
5. Use of a toothbrush according to any preceding claim for
brushing the teeth.
- 20 6. Use of a toothbrush according to any of claims 1-4 for
polishing the teeth.

Fig.1.

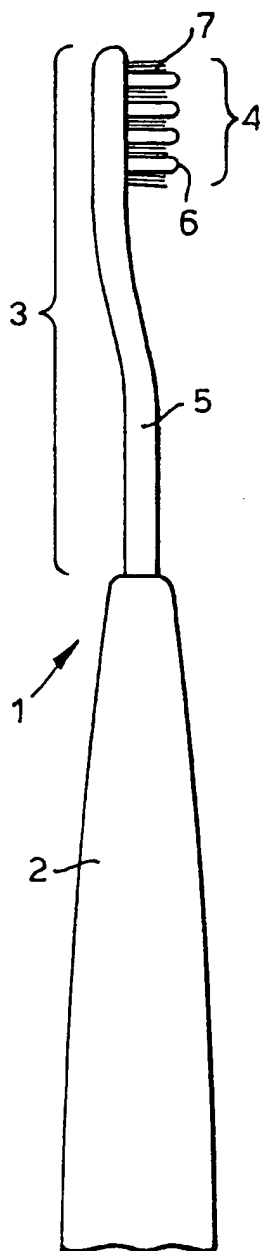


Fig.2.

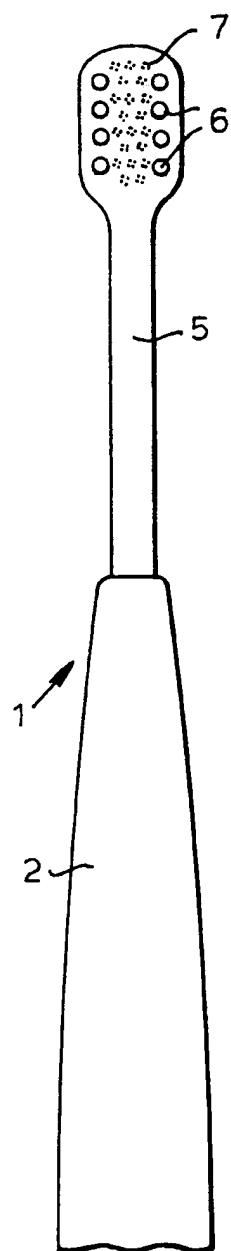
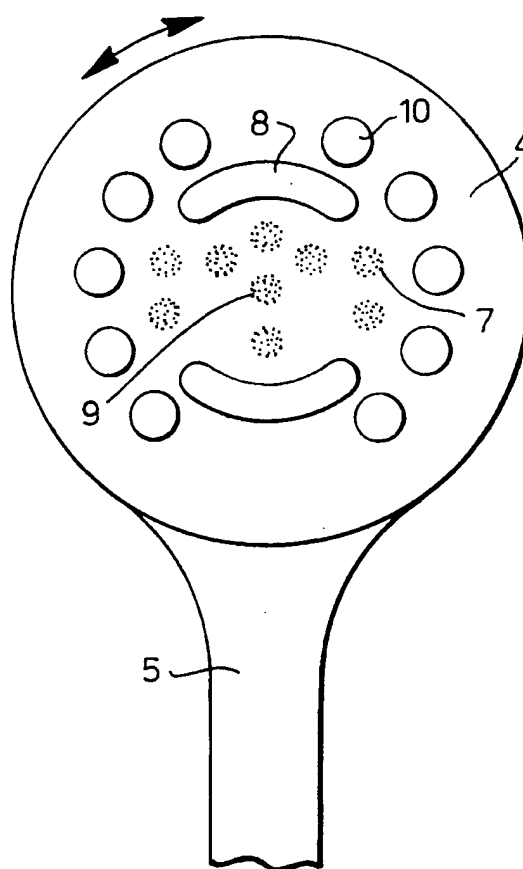


Fig.3.



INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05947

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A46B9/04 A46B9/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A46B A61C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 435 329 A (STAAR DEV CO SA) 3 July 1991 (1991-07-03) abstract column 3, line 36 - line 46 figures 1,4,5	1,2,4-6
Y	---	3
Y	US 5 735 011 A (ASHER RANDALL S) 7 April 1998 (1998-04-07) abstract column 3, line 4 - line 42 figures 1,2	3
Y	US 5 689 850 A (SHEKALIM AVRAHAM) 25 November 1997 (1997-11-25) abstract figure 1	1-6

	-/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

21 August 2000

Date of mailing of the international search report

28/08/2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Ottesen, R

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 00/05947

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 604 951 A (SHIPP ANTHONY D) 25 February 1997 (1997-02-25) abstract column 3, line 48 -column 4, line 9 figures 1,4 ---	1-6
A	EP 0 360 766 A (MARINO ANTONIO) 28 March 1990 (1990-03-28) abstract column 2, line 10 -column 2, line 28 figures 1-3 ---	1-6
A	US 5 497 526 A (KLINKHAMMER RONALD W) 12 March 1996 (1996-03-12) abstract figures 1,3 -----	1-6

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/05947

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0435329 A	03-07-1991	US 5165131 A	24-11-1992
US 5735011 A	07-04-1998	AU 5427698 A	10-06-1998
		WO 9822000 A	28-05-1998
US 5689850 A	25-11-1997	IL 112207 A	12-03-1999
US 5604951 A	25-02-1997	AU 4423996 A	24-07-1996
		WO 9620654 A	11-07-1996
EP 0360766 A	28-03-1990	NONE	
US 5497526 A	12-03-1996	US 5171066 A	15-12-1992
		US 5531582 A	02-07-1996
		US 5316027 A	31-05-1994
		US 5224764 A	06-07-1993
		AU 650417 B	23-06-1994
		AU 3060989 A	11-08-1989
		CA 1338515 A	13-08-1996
		DE 68916949 D	25-08-1994
		DE 68916949 T	02-03-1995
		EP 0398976 A	28-11-1990
		JP 3503491 T	08-08-1991
		KR 9610985 B	14-08-1996
		MX 169377 B	30-06-1993
		WO 8906528 A	27-07-1989
		WO 9001281 A	22-02-1990
		US 5360025 A	01-11-1994
		US 5360026 A	01-11-1994
		US 5669097 A	23-09-1997
		US 5228466 A	20-07-1993
		US 5380069 A	10-01-1995
		US 5284168 A	08-02-1994